Center Innovation Fund: MSFC CIF

Carbon Nanotube Composite SHM Sensor using Additive Manufacturing

Completed Technology Project (2017 - 2018)

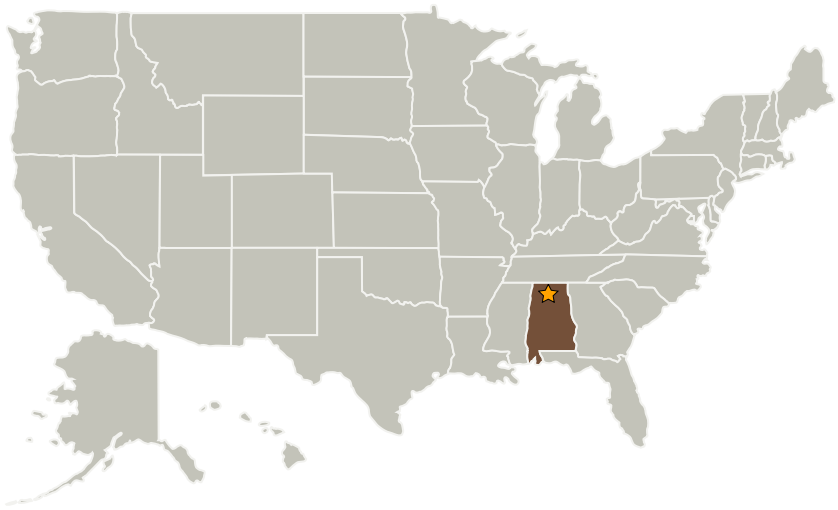
Project Introduction

We propose to develop a piezoelectric sensors made of carbon nanotube and lead zirconium titanate (PZT) nanopower dispersed in a polymer matrix. These sensors will be flexible and able to be integrated between composite piles as well as adhered to the structure surfaces.

Anticipated Benefits

At the present time strain sensors used on structures require external wires to a computer in order to measure strain. Also these strain sensors are quite brittle. Another type of strain sensor is a fiber optic with Fiber Bragg gratings etched into the material. Again, this limits the sensor to initial proof testing of the structural article.

Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
★Marshall Space Flight Center(MSFC)	Lead Organization	NASA Center	Huntsville, Alabama
Army Material Research Development and Engineering Center	Supporting Organization	US Government	

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Primary U.S. Work Locations
Alabama

Project Website:

https://www.nasa.gov/directorates/spacetech/home/index.html

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Marshall Space Flight Center (MSFC)

Responsible Program:

Center Innovation Fund: MSFC CIF

Project Management

Program Director:

Michael R Lapointe

Program Manager:

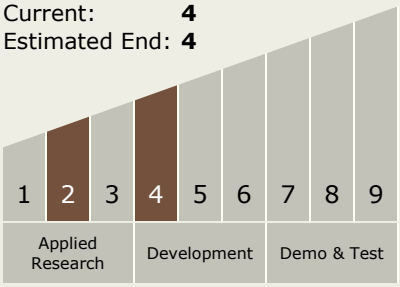
John W Dankanich

Principal Investigator:

Dennis S Tucker

Technology Maturity (TRL)

Start: **2**
Current: **4**
Estimated End: **4**



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Technology Areas

Primary:

- TX08 Sensors and Instruments
  - TX08.3 In-Situ Instruments and Sensors
    - TX08.3.5 Electromagnetic Wave Based Sensors

Target Destination

Foundational Knowledge